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Septic Tank Maintenance

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The most common wastewater treatment system used in rural areas is the septic tank-soil absorption system. The septic tank removes settleable and floatable solids from the wastewater, and the soil absorption field filters and treats the clarified septic tank effluent. Removing the solids from the wastewater protects the soil absorption system from clogging and premature failure. In addition to removing solids, the septic tank also permits digestion of a portion of the solids and stores the undigested portion.

The septic tank removes solids by holding wastewater in the tank, which allows the solids to settle and scum to rise to the top. To accomplish this, wastewater should be held in the tank for at least 24 hours. Up to 50 percent of the solids retained in the tank decompose. The remaining solids accumulate in the tank. Biological and chemical additives are not needed to aid or accelerate decomposition.

As the septic system is used, sludge continues to accumulate in the bottom of the septic tank. Properly designed tanks have enough space for up to 3 years' safe accumulation of sludge. When the sludge level increases beyond this point, sewage has less time to settle properly before leaving the tank. As the sludge level increases, more solids escape into the absorption area. If sludge accumulates too long, no settling occurs before the

Table 1. Estimated Septic Tank Pumping Frequencies In Years (for year-round residence)

Tank Size (gal)	Household Size (Number of People)									
	1	2	3	4	5	6	7	8	9	10
500	5.8	2.6	1.5	1.0	0.7	0.4	0.3	0.2	0.1	--
750	9.1	4.2	2.6	1.8	1.3	1.0	0.7	0.6	0.4	0.3
1000	12.4	5.9	3.7	2.6	2.0	1.5	1.2	1.0	0.8	0.7
1250	15.6	7.5	4.8	3.4	2.6	2.0	1.7	1.4	1.2	1.0
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8	1.5	1.3
1750	22.1	10.7	6.9	5.0	3.9	3.1	2.6	2.2	1.9	1.6
2000	25.4	12.4	8.0	5.9	4.5	3.7	3.1	2.6	2.2	2.0
2250	28.6	14.0	9.1	6.7	5.2	4.2	3.5	3.0	2.6	2.3
2500	31.9	15.6	10.2	7.5	5.9	4.8	4.0	4.0	3.0	2.6

Note: More frequent pumping needed if garbage disposal is used.

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sewage escapes directly to the solid absorption area. To prevent this, the tank must be pumped periodically. The material pumped out of the tank is known as "septage."

The frequency of pumping depends on several factors:

- capacity of septic tank
- flow of wastewater (related to size of household)
- volume of solids in wastewater (more solids if garbage disposal is used)

Table 1 gives the estimated pumping frequencies according to septic tank capacity and household size. The frequencies were calculated to provide a minimum of 24 hours of wastewater retention assuming 50 percent digestion of the retained solids.

In Texas, a 1,000-gallon septic tank is used for a home with three bedrooms. If six people reside in a three-bedroom house, the tank should be pumped every 1.5 years. If the same system serves a family of two, the tank would be ready for pumping every 5.9 years. Systems installed before the current rules and regulations may have smaller septic tanks. As shown in Table 1, these tanks may need to be pumped more often than once a year.

It is important to note that the soil absorption field will not fail immediately when a full tank is not pumped. However, the septic tank is no longer protecting the soil absorption field from solids. Continued neglect will result in failure, and the soil absorption field may need to be replaced. In some cases, replacement of the absorption area may not be possible due to site limitations.

Cleaning the Tank

Septic tank pump and haul contractors can clean your tank. It is a good idea to supervise cleaning to ensure that it is done properly. To extract all the material from the tank, the scum layer must be broken up and the sludge layers stirred up into a liquid portion of the tank (see Figure 1). This is usually done by alternately siphoning liquid from the tank and reinjecting it into the bottom of the tank. The septic tank should be pumped out through the large central manhole, not the baffle inspection ports. Pumping out a tank through the baffle inspection ports can damage the baffles.

Before closing the tank, check the condition of the baffles. If they are missing or deteriorated, replace them with sanitary tees. It should never be necessary to enter a septic tank. Any work to replace the baffles or repair the tank should made from the outside. The septic tank produces toxic gases which can kill a person in a matter of minutes. When working on a tank make sure the tank is well ventilated and someone is standing by. Never go into a septic tank to retrieve someone who fell in and was overcome by toxic gases or the lack of oxygen without a self-contained breathing apparatus (SCBA). If a SCBA is not available the best thing to do is call for emergency services and put a fan at the top of the tank to blow in fresh air.

To facilitate future cleaning and inspection, install risers from the central manhole and inspection ports to the surface or near the surface before burying the tank. Also mark the location of the tank so that it can be easily located.

Summary

The septic tank is only one part of an on-site wastewater system. It is designed to remove solids to protect the soil absorption system, provide for the digestion of a portion of those solids, and store the remaining solids. Biological and chemical additives are not needed to aid or accelerate decomposition. Garbage disposals are also not recommended, because they impose an additional solids load on the system. Solids must be removed periodically from the septic tank to keep them from entering the soil absorption system. For a properly designed septic system, the tank should be inspected and pumped every 1 to 5 years.

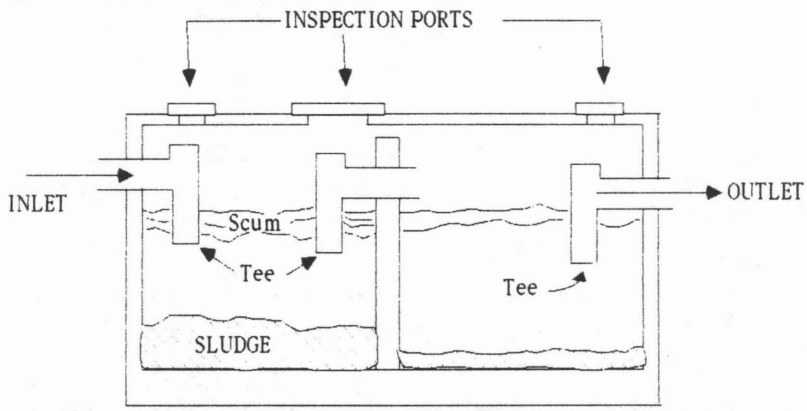

Figure 1. Cross Section of Two Compartment Septic Tank

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